ONE-CHIP MICRO-INTEGRATED OPTOELECTRONIC SENSOR

ABSTRACT OF THE DISCLOSURE

[0066] This disclosure describes one-chip micro-integrated optoelectronic sensors and methods for fabricating and using the same. The sensors may include an optical emission source, optical filter and a photodetector fabricated on the same transparent substrate using the same technological processes. Optical emission may occur when a bias voltage is applied across a metal-insulator-semiconductor Schottky contact or a p-n junction. The photodetector may be a Schottky contact or a p-n junction in a semiconductor. Some sensors can be fabricated on optically transparent substrate and employ back-side illumination. In the other sensors provided, the substrate is not transparent and emission occurs from the edge of a p-n junction or through a transparent electrode. The sensors may be used to measure optical absorption, optical reflection, scattering or fluorescence. The sensors may be fabricated and operated to provide a selected spectrum of light emitted and a multi-quantum well heterostructure may be fabricated to filter light reaching the photodetector.